

Electron Impact Ion Source

Abstract of the Disclosure

An ion source configured for integration into both existing ion implanters used in semiconductor manufacturing and emerging ion implantation platforms, and is also suitable for use in ion dosing systems used in the processing of flat panel displays. The ion source in accordance with the present invention includes the following features, all of which depart from the prior art to produce a well-focused, collimated and controllable ion beam:

- Ionizing electron beams generated external to the ionization chamber, thereby extending the emitter lifetime.
- 90 degree magnetic deflection of electron beams such that no line-of-sight exists between the emitter and the process gas load, and the emitter is protected from bombardment by energetic charged particles.
- Two opposed electron beams which can be operated simultaneously or separately.
- Use of a deceleration lens to adjust the ionization energy of the electron beam, substantially without affecting electron beam generation and deflection.